

3.

Miscellaneous Notes on the Eggs and Young of Texan and Mexican Reptiles.

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(Plates I-VII).

Scarcely any field work has been done on the habits of Mexican reptiles, and even the mode of reproduction (whether oviparity or ovoviviparity) of only a very few is known with certainty. For example, no information on breeding habits is available in Smith (1939) for 63 of the 80 forms of *Sceloporus* listed by him as occurring in Mexico. Other illustrations are frequent. In view of this general lack of information, the following notes, although fragmentary, may be of some value.

Opportunities for collecting Mexican reptiles during 1949 and 1950 and subsequently returning these alive to the San Antonio Zoo for observation, resulted in an accumulation of miscellaneous notes on the breeding habits of various snakes and lizards of Mexico. A few supplementary notes are from observations of snakes purchased from dealers.

In addition, considerable information on the eggs and young of some Texan reptiles has been mustered, mostly from material collected by me, but also from specimens donated to the Zoo by local people.

Of particular interest are the records of eggs and young about which nothing has been recorded previously. These records, i.e., *Coleonyx brevis*, *Crotaphytus reticulatus*, *Sceloporus grammicus microlepidotus*, *Eumeces brevilineatus*, *Eumeces tetragrammus*, *Abronia taeniata graminea*, *Heterodon nasicus kennealyi*, *Masticophis m. mentovarius*, and *Trimorphodon biscutatus semirutus*, whenever possible, are accompanied by a brief description of the hatchlings or newborn snakes.

The larger snakes were kept in regular zoo exhibition cages while the smaller snakes and all the lizards were confined individually in gallon glass jars covered with screen lids. Eggs were incubated in Pyrex dishes partially filled with damp sand, and this medium was covered with a dampened paper hand towel upon which the eggs were placed. Moisture within the containers was controlled by placing a glass lid over each dish, which could be moved aside to permit excess moisture to escape, and replaced when it was desired to retain moisture. Prevailing temperatures during incubation varied from 70 to 90 degrees Fahrenheit.

All measurements, recorded in millimeters and arranged in order of increasing length, were taken as soon as possible after laying, hatching, or birth of young—usually on the same day.

Richard Friedrich, President of the San Antonio Zoological Society, and Fred Stark, San Antonio Zoo Director, kindly made possible the time for numerous collecting trips without which many of the specimens would not have been procured. For several local specimens I am indebted to Jack Ried and Glen Fry, both of San Antonio, and Ralph Axtell, of Bishop, Texas.

***Coleonyx brevis* Stejneger.**

Smith (1946) says of this species, "The life history . . . is unknown. Presumably eggs are laid."

Two females from 15 miles north of San Ygnacio, Texas, laid eggs on April 8, 1950, but none hatched. The egg shells were smooth and white.

I. Female measured: total length, 107 mm.; tail, 46 mm.

No.	Length	Width
1	15	8
2	16	9
	Average 15.5	8.5

II. One egg was laid by a female of undetermined length.

No.	Length	Width
1	17	8

***Crotaphytus reticulatus* Baird.**

No information is available in the literature on the number or size of the eggs laid by this form. Smith (1946) states it is one of the least known lizards of the country and that its life history is practically unknown.

A female collected in Starr County, Texas, on June 1, 1950, was obviously gravid when caught, the outlines of the eggs being very pronounced against the body wall. The lizard died of undetermined causes on January 24, before oviposition could take place, and dissection disclosed 8 well-developed eggs, almost spherical in shape.

No.	Length	Width
1	10	9
2	13	13
3	14	14
4	15	13
5	15	13
6	15	13
7	15	14
8	16	14
	—	—
	Average 14.1	12.8

Sceloporus variabilis variabilis Wiegmann.

A female from near Las Vigas, Veracruz, (elevation 7,500 feet), died at the Zoo on February 11, 1950. Dissection revealed 7 developing embryos, partially enclosed in yolk sacs. They had clearly defined patterns similar to that of the female.

No.	Total length
1	25
2	25
3	26
4	26
5	26
6	27
7	28
	—
	Average 26.1

Sceloporus grammicus microlepidotus
Wiegmann.

Smith (1939) says of this race, "As recorded by Herrera, Gadow, and others, *m. microlepidotus* (= *grammicus microlepidotus*) is ovoviviparous." This apparently is the extent of information available on the young.

Seven gravid females were collected in an area of volcanic rock, 3 miles east of Las Vigas, Veracruz, Mexico, January 15 and 16, 1950. Elevation at this site is 7,500 feet.

I. A female, 127 mm. in total length, with a tail 59 mm. long, gave birth to 7 young during the night of January 11, 1950.

No.	Total length	Tail length
1	51	29
2	52	28
3	52	29
4	52	30
5	53	29
6	53	30
7	53	31
	—	—
	Average 52.2	29.4

The young of this and the following broods of *microlepidotus* are much alike in pattern and color, the only important variation being a shortening of the wavy, transverse bands in some specimens or their almost complete absence in others, resulting in a pattern of small, paired dorsal spots.

The living young are described as follows:

All have a velvety appearance. Dorsum gray to dark brown, stippled with darker and lighter flecks which become more pronounced laterally. Five to 7 dark brown or black transverse dorsal bands; tail bands 14 to 19, averaging 18. The gular fan is erect and quite pronounced in some individuals, even in those not excited. However, the brilliant color characteristic of the fan in adult males, is lacking. Superciliaries black, banded with pale yellow; these bands being half as wide as the black spaces between them. Lower eyelids black.

A narrow, dark line, in the form of an obtuse angle, begins at the anterior edge of the median frontonasal, the arms reaching the posterior edges of the outer frontonasals. A similar but shorter line behind this one. Two narrow, irregular postocular dark stripes extend slightly downward from the orbit, through the ear opening, and unite with the nuchal collar. Another narrow, dark line extends upward and backward from the orbit. Upper and lower labials with a yellowish-orange tinge.

Black nuchal collar edged on either side with pale yellow. Beginning on front of shoulders, it continues uninterrupted across nape, or, more rarely, is separated mid-dorsally by several scale rows. Posterior edge of collar regular; anterior, irregular. In some specimens the nuchal collar is interrupted mid-dorsally by several small, irregular, black spots. A light pineal spot is present in most individuals.

Dorsal color of limbs same as that of body above, and marked with indistinct, narrow, black bands. Ventrums and underside of limbs dark metallic-green and immaculate.

II. This female, 145 mm. long, gave birth to 5 young on February 25, 1950.

No.	Total length	Tail length
1	54	29
2	56	26
3	57	22
4	57	33
5	57	34
	—	—
	Average 56.4	28.8

III. A female with a total length of 116 mm. gave birth to 5 young on February 12, 1950, between 10:00 a.m. and 2:31 p.m.

No.	Total length	Tail length
1	56	33
2	57	33
3	59	34
4	60	36
5	62	38
	—	—
	Average 58.8	34.8

IV. Seven young were born on February 7, 1950, to a female 114 mm. long.

No.	Total length	Tail length
1	46	20
2	46	21
3	47	21
4	48	22
5	50	22
6	50	23
7	51	23
—	—	—

Average 48.2 21.7

V. A female, 126 mm. in length, gave birth to 5 young on February 18, 1950.

No.	Total length	Tail length
1	53	24
2	53	24
3	55	24
4	56	23
5	57	26
—	—	—

Average 55.8 24.2

VI. Four young were born on February 16, 1950, to a female 117 mm. long.

No.	Total length	Tail length
1	47	21
2	48	22
3	50	22
4	51	23
—	—	—

Average 49.0 22.0

VII. Seven young were born on March 6, 1950, to a female measuring 146 mm.

No.	Total length	Tail length
1	54	28
2	55	29
3	55	30
4	55	31
5	56	28
6	57	31
7	58	34
—	—	—

Average 55.7 30.1

The young were quite active soon after birth, crawling over and under the leaves in their cages and climbing to the tops of limbs, where they remained sometimes for hours. Their ability to leap from the cage floor to half-way up to a twelve-inch limb was a most amazing feat. Small ants and fly larvae were offered as food a week after birth of the lizards, and although the ants were pursued and eaten, the larvae were rejected after a cursory examination.

Sceloporus torquatus torquatus Wiegmann.

A large female collected by Miss Juanita Krackowitz in the Mexican state of Michoacan, near Morelia, gave birth to 6 young on May 8, 1950.

No.	Total length	Tail length
1	70	39
2	70	40
3	70	41
4	71	39
5	71	39
6	71	40
—	—	—

Average 70.4 39.6

The young are described as follows:

Ground color dark gray. Head gray except for an area of dull bronze on the frontal and a small, dark green spot on the anterior portion of the interparietal. A few small, black specks widely scattered over the head. Side of head becoming gradually lighter behind eye, but light area below canthus rostralis sharply contrasting with darker color above. Upper palpebrals bluish-green, edged with black; lower palpebrals similar but with more black. Chin gray, suffused with bluish-green. Dark blue, uninterrupted nuchal collar, somewhat lighter mid-dorsally, 3 to 3½ scales wide. Collar with white posterior edge, except mid-dorsally; anterior edge white.

Five pairs of indistinct, dark spots along back. A lateral series of smaller dark spots. Tail with 16-18 dark gray bands, 2 or 3 scales wide, becoming indistinct ventrally. Legs and digits with dark gray bands above, similar to those on tail. Ventrums light gray, suffused with greenish-blue.

Leiolopisma laterale (Say).

The egg-laying period of this species as noted by Smith (1946), extends from early June to early August.

Four females collected by Lester Ellsworth at San Marcos, Texas, laid eggs at the San Antonio Zoo during April and early May, 1950.

I. This female laid 4 eggs on April 19.

No.	Length	Width
1	8	4
2	9	4
3	9	4
4	9	5
—	—	—

Average 8.7 4.2

II. A female, 38 mm. long, laid 2 eggs on April 27.

No.	Length	Width
1	8	3
2	9	4
—	—	—

Average 8.5 3.5

III. Three eggs were deposited by a large female on April 29.

No.	Length	Width
1	9	4
2	9	4
3	9	5
—	—	—

Average 9.0 4.3

IV. On May 1, a female laid 2 eggs.

No.	Length	Width
1	9	4
2	9	5
Average 9.0		4.5

***Eumeces lynxe furcirostris* (Cope).**

Two adult females were collected 3 miles east of Las Vigas, Veracruz, Mexico, January 16, 1950.

I. This lizard gave birth to 5 young on March 12, 1950. Total length of female, 124 mm.

No.	Total length	Tail length
1	50	24
2	51	25
3	52	25
4	54	25
5	55	27
Average 52.4		25.2

II. On March 17, 1950, 3 young were born to a female 134 mm. long.

No.	Total length	Tail length
1	47	23
2	54	24
3	57	26
Average 52.6		24.3

***Eumeces brevilineatus* Cope.**

Smith (1946) states that the life history of this lizard is not known.

On April 13, 1949, a large female, measuring 182 mm. in total length, was collected under old papers on Somerset Road, just south of San Antonio, Texas. On May 18, thirty-five days after capture, the lizard laid 7 non-granular, non-adhesive eggs, the first of a complement of 12. The following day another egg was deposited, and subsequently, on May 20, four additional eggs were laid. Three of these, which were soft and buff-colored, soon desiccated.

No.	Length	Width
1	10	7
2	10	7
3	11	8
4	11	8
5	12	6
6	12	7
7	12	8
8	12	8
9	12	8
10	12	8
11	12	8
12	12	8
Average 11.5		7.5

With apparently good reason, the female made no attempt to bury the eggs or to cover them with the slightly damp sand upon which

they were deposited. Taylor (1935) notes that the eggs laid by captive *Eumeces s. septentrionalis* invariably rotted if completely covered by moist earth.

Although on several occasions the lizard was found coiled loosely about the eggs for short periods, this behavior was not consistent and therefore does not seem sufficient evidence that bodily incubation of the eggs is normal for this species.

Three of the eggs hatched, the others having desiccated during incubation. Two young emerged from their shells on the morning of June 13, between 8:05 a.m. and 8:14 a.m.; the third on the morning of June 14.

No.	Total length	Tail length
1	49	24
2	51	25
3	53	26
Average 51.0		25.0

The young are considerably darker than the parent. Dorsal ground color is deep chocolate brown, each scale with a light posterior edge. Sharply defined cream colored dorso-lateral lines extend backward from tip of snout, passing above nostrils and across supraoculars, and disappearing well behind axilla. Union of the dorsolateral light lines on the snout results in a light, vertical bar through the rostral. Well defined lateral lines extend backward from rostral, the same distance as dorsolateral lines.

Chin and throat light brown and immaculate. Ventrums light brown anteriorly, becoming gradually darker posteriorly. Tail above chocolate brown at base, rapidly becoming light green posteriorly. Posterior three-quarters of tail azure blue. Fore-legs uniformly dark brown above; immaculate and dirty white beneath. Hind legs uniformly dark brown above and but little lighter below.

***Eumeces tetragrammus* Baird.**

Two females laid eggs at the Zoo during 1950.

I. Twelve eggs were laid on the morning of April 27, 1950, by a large female collected at the northern outskirts of Laredo, Texas.

No.	Length	Width
1	7	12
2	9	7
3	10	6
4	10	7
5	10	7
6	10	7
7	10	8
8	11	7
9	11	7
10	11	7
11	11	7
12	12	7
Average 10.2		7.4

II. Another female from the same locality as the first, laid 5 eggs on May 4, 1950.

No.	Length	Width
1	12	6
2	12	7
3	13	8
4	14	7
5	14	8
	—	—
	Average 13.0	7.2

***Abronia taeniata graminea* (Cope).**

Smith (in letter) states there is absolutely nothing known regarding the breeding habits and life history of this species.

Many individuals of the species *taeniata* found in the Las Vigas area of Veracruz appear to be intergrades between the races *taeniata* and *graminea*. Our specimens exhibit characteristics of both forms, although they favor the latter.

A large female from 3 miles east of Las Vigas, Veracruz, Mexico, gave birth to 4 young on April 12, 1950.

No.	Total length	Tail length
1	67	36
2	72	39
3	74	40
4	76	41
	—	—
	Average 72.2	39.0

The young are described as follows:

Top of head bluish-green, lightly flecked with black. A postocular black marking on either side of head, directed backward and upward to the tertiary temporals, thence narrowing as it extends forward from these scales, along the outer edges of the supraoculars. An irregular, small, black parietal spot near back of the head. Immediately behind this, extending laterally, are two large, black spots. A narrow, black line extends in an arc from below the eye to the loreal. Below this is a somewhat wider postocular black stripe from behind the eye to the ear opening. Lower edges of upper labials irregularly edged with black.

A series of 9 irregular, black crossbands on body, 19 on tail; those near end of tail reduced to mere spots. Ground color on back, light tan or dirty-white. A series of somewhat diffused secondary lateral spots extending onto edge of ventrum. Limbs banded above with black. Soles of feet a pale greenish-yellow. Ventrums immaculate and dirty-yellow.

In two specimens the crossbands are shortened and interrupted mid-dorsally, resulting in a pattern of small, paired spots, irregular and variable in shape (Pl. II, Fig. 5).

***Gerrhonotus illocephalus infernalis* Baird.**

I. A female from Medina County, Texas, laid 3 eggs between 3:02 p.m. and 6:30 p.m. on January 30, 1950; two more between 6:15 p.m. and 6:30 p.m. on January 31; and 5

more on February 1. The eggs were white, non-granular and non-adhesive.

No.	Length	Width
1	15	9
2	16	9
3	16	10
4	16	10
5	17	9
6	17	11
7	17	13
8	18	9
9	18	10
10	19	9
	—	—
	Average 16.9	9.9

II. A female from central Texas laid 5 eggs under a piece of bark in her cage on February 18, 1950. These were white, non-granular and non-adhesive.

No.	Length	Width
1	19	10
2	19	10
3	19	11
4	19	11
5	20	10
	—	—
	Average 19.2	10.4

During incubation, 2 of the eggs became moldy and were discarded. Egg slits were seen to appear in 2 of the remaining eggs on the morning of March 31, and in the last egg about noon of April 1. By 1:00 p.m., April 2, all the lizards had emerged from their shells.

No.	Total length	Tail length
1	90	34
2	95	35
3	99	36
	—	—
	Average 94.6	35.0

***Heterodon nasicus kenneerlyi* Kennicott.**

Seven eggs were found in a sack containing a female brought to the Zoo on June 3, 1950. The snake, which measured 656 mm. in total length and 76 mm. in tail length, was collected in Starr County, Texas. The eggs were white, smooth and non-adherent. They were beginning to desiccate when discovered and failed to hatch.

No.	Length	Width
1	20	15
2	22	14
3	22	15
4	23	14
5	23	15
6	24	14
7	24	15
	—	—
	Average 22.5	14.5

***Masticophis flagellum testaceus* (Say).**

A female from San Antonio, Texas, measuring 1,324 mm., laid 8 eggs on June 6, 1950. These were white and granular.

No.	Length	Width
1	40	22
2	44	22
3	45	22
4	46	23
5	46	23
6	49	22
7	51	25
8	57	24
Average 47.2		22.9

Masticophis mentovarius mentovarius
(Dumeril & Bibron).

Ortenburger (1928) gives no information concerning the eggs of this form, nor are data on its breeding habits available elsewhere in the literature.

A large female collected on January 15, 1950, several miles north of Alvarado, Veracruz, Mexico, deposited 17 eggs between March 23 and 25, 1950. These were white, non-adhesive, and covered with fine, salt-like grains (Pl. V, Fig. 11). Three were discovered on the cage floor on the morning of March 23, and 9 were laid that day at intervals of 39 to 72 minutes, with an average between ovipositions of 51 minutes. Three additional eggs were found in the cage on the morning of March 24, and 2 more the following morning, March 25. Desiccation of the eggs apparently took place during an attempt to photograph them under hot photo-flood lights. In spite of subsequent efforts to save them by the use of additional moisture, they soon dried beyond recovery.

No.	Length	Width	Weight (in grams)
1	46	30	26.6
2	48	30	24.0
3	51	30	24.7
4	51	31	24.0
5	51	33	24.5
6	52	32	23.3
7	54	32	25.9
8	54	34	24.7
9	55	29	26.6
10	55	31	26.5
11	57	26	22.3
12	58	31	24.9
13	58	32	26.2
14	61	29	26.9
15	61	30	26.4
16	61	32	26.9
17	64	30	25.9
Average 55.1		30.7	25.3

Drymobius margaritiferus margaritiferus
(Schlegel).

A female, 940 mm. long, laid 2 infertile eggs on July 29, 1950. These had non-adhesive, non-granular shells.

No.	Length	Width
1	43	15
2	45	14
Average 44.0		14.5

Elaphe laeta laeta (Baird & Girard).

On June 14, 1950, a female 1,136 mm. long, from near Brownsville, Texas, laid 5 smooth, adhesive eggs. Ten more were deposited the following day, June 15.

No.	Length	Width
1	40	29
2	41	30
3	42	27
4	43	28
5	43	28
6	44	29
7	45	28
8	45	29
9	45	30
10	46	29
11	46	29
12	46	30
13	47	28
14	47	31
15	50	30
Average 44.6		29.0

Slits first appeared in 2 of the eggs on August 7, and these snakes emerged from their shells on August 8. Two additional snakes escaped from their shells on August 9, another on August 10, and the last two on August 12.

No.	Length	Width
1	370	63
2	377	68
3	377	69
4	380	65
5	395	65
6	397	66
7	397	67
Average 384.7		66.1

Examined several days after hatching, the young may be described as follows:

Dorsal ground color very light brown. The dorsal body blotches, which number from 33 to 36 and show an average of 35, have a chestnut brown color and are from 4 to 6 scales long and 8 to 12 scales wide. Each blotch bears a dark brown border, $\frac{1}{2}$ scale wide; more distinct on the anterior and posterior than on the lateral edges. Dorsal tail blotches 22 to 26. A series of lighter colored lateral blotches below and alternating with the dorsal series, being regular in size and shape. Small dark brown spots, irregular in size and shape, below the secondary blotches, extending from the third and fourth rows of scales to the lateral edges of the ventrals.

Ventrum pale pink and marked with many small, rectangular spots which tend to group in pairs and generally are more numerous along the outer edges of the ventrals.

Snout, from top of rostral to anterior edge of prefrontals, olive brown. A dark, U-shaped interocular stripe extends across posterior portions of prefrontals, anterior edge of frontal, anterior portions of supraoculars, and upper part of preoculars. A postocular stripe of similar color begins directly behind orbit, terminating on the seventh and

eighth, or eighth and ninth upper labials. A dark brown subocular spot occupies portions of fourth, fifth and sixth upper labials. Additional small, brown spots on the lower halves of first, second and third upper labials.

The first nuchal blotch separates near the back of the head; the two attenuated halves continuing forward as two arms of a pincer through the middle outer edges of the parietals, to the posterior third of the frontal. A small, brown spot, usually round, covers the center of the frontal. Small, irregular, brown spots on the outer edges of the mental and along sutures of the lower labials. Remainder of chin and throat immaculate.

Elaphe obsoleta confinis Baird & Girard.

I. A small female, 762 mm. in length, collected by Jack Ried at Los Olmos Dam, San Antonio, Texas, deposited 5 eggs on June 24, 1949. These white, non-granular eggs were found in a shallow depression in the sand which covered the cage floor, the excavation apparently having been made by the female before or during egg laying.

No.	Length	Width
1	67	18
2	67	21
3	70	19
4	71	20
5	76	20
Average 70.2		19.6

Slits were seen to appear in one egg of the clutch on August 15. This snake emerged from its shell on August 16. The remaining 4 eggs hatched on August 17.

No.	Total length	Tail length
1	418	68
2	419	64
3	431	70
4	448	78
5	447	76
Average 432.6		71.2

II. On July 19, 1950, fourteen eggs were found by Jack Ried near San Antonio, Texas, in the top of a rotted, standing tree trunk, over 5 feet above the ground. Egg shells of a previous hatching, probably last year's, were found with the live eggs.

No.	Length	Width
1	43	28
2	43	30
3	43	30
4	43	31
5	43	32
6	44	29
7	44	30
8	45	31
9	46	29
10	46	30
11	46	31
12	46	31
13	46	32
14	47	31
Average 44.6		30.3

The eggs hatched on July 27, 28 and 29.

No.	Total length	Tail length
1	387	69
2	396	65
3	413	77
4	413	79
5	415	71
6	437	79
7	441	68
8	442	77
9	455	79
10	457	75
11	457	81
12	500	76
13	501	80
14	510	84
Average 444.5		75.7

A comparison of the pattern of these young with that of a Florida *confinis* now at hand, apparently also recently hatched, is interesting in view of the current uncertain status of the western population, formerly called *lindheimeri* and later placed in synonymy with *confinis*.

Adult Texan *confinis*, as a group, are extremely variable in both pattern and coloration, even within a small geographic area, but all of the 45 or 50 young examined thus far (this group included) have been consistently similar in these characteristics.

The juvenile Florida *confinis*, received from E. Ross Allen and collected at Wakulla Springs in Wakulla County, is readily distinguishable from young Texan specimens by (1) the smaller dorsal blotches and (2) the wider intervening spaces separating them.

A typical juvenile from Texas (No. 2, above) has 33 dorsal blotches on the body and 15 caudal blotches, those on the body being from 3 to 5 scales long (average 4.5) and from 10 to 13 scales wide (average 12). The spaces between blotches are from 2 to 3.5 scales long (average 2.5). The Wakulla Springs specimen measures 332 mm. in length and possesses 30 dorsal body blotches and 15 tail blotches. In comparison with the Texan young, it has body blotches which are from 3 to 5 scales long (average 4.5) and from 7 to 9 scales wide (average 8.5). Spaces between blotches vary in length from 3 to 7 scales (average 4).

Other conspicuous differences are the proportionately much smaller lateral blotches of the Wakulla Springs young and the lighter, almost white, ground color of this specimen as compared with the light gray ground color of the Texan young.

An adequate series of young from the eastern part of the range is necessary before these differences can be proved consistent.

III. A 1,374 mm. long female from several miles north of Junction, Texas, laid 7 eggs on June 19, 1950.

No.	Length	Width
1	61	26
2	63	25
3	65	24
4	65	27
5	66	24
6	70	25
7	71	26
	—	—
Average 65.8		25.3

Three of these hatched on August 7.

No.	Total length	Tail length
1	443	73
2	451	75
3	463	78
	—	—
Average 452.3		75.3

IV. A female caught on the grounds of Incarnate Word College, San Antonio, Texas, laid 1 egg on June 13, 1950, 2 eggs on June 15 and 6 on June 16.

No.	Length	Width
1	41	22
2	41	23
3	42	23
4	42	24
5	44	24
6	44	24
7	45	24
8	45	25
9	47	23
	—	—
Average 43.4		23.5

One of these eggs hatched on August 8; four on August 9.

No.	Total length	Tail length
1	227	47
2	415	65
3	428	66
4	431	69
5	442	72
	—	—
Average (of 4) 424.0		64.0

Hatchling No. 1 is an aberrant runt with a pattern of well-defined longitudinal stripes (Pl. VI, Fig. 14), and is described as follows:

Dorsal ground color gray, tinged with yellow mid-dorsally. The center of each scale with more or less dense, black pigment; the posterior edge dirty-white. Two black dorsal stripes, $2\frac{1}{2}$ scales wide, beginning near the parietals and terminating at the tip of the tail. A narrow lateral line on either side of the dorsal stripes, beginning on the neck (where they are 2.5 scales wide), decreasing gradually in width, and terminating at a point several inches from the head (where they are a half scale wide). Many narrow, black, longitudinal streaks dorsally and laterally, becoming more numerous along the sides. These are generally from 3 to 5 scales long. A black spot on the outer edge of each ventral scale, forming a broken line from the third ventral to the tip of the tail. Ventrals with a suffusion of dark pigment.

Top of head gray. Snout somewhat darker than remainder of head. An interocular black stripe crosses the posterior halves of the prefrontals, the extreme anterior edge of the frontal, and sutures of the supraoculars and prefrontals. An irregular, transverse, dark mark across the middle of the frontal. Post-ocular dark stripe from orbit to seventh and eighth upper labials. Posterior edges of upper and most of lower labials with some black marking.

***Lampropeltis getulus splendida* (Baird & Girard).**

During the night of July 24, 1950, a female from Christine, Texas, deposited 12 eggs in the water dish in its cage, but as a result of lying in the water for many hours before discovery, the eggs became hard and turgid and failed to hatch. The following measurements, therefore, must be considered abnormally large and probably out of true proportion, since the water-soaked eggs undoubtedly lost their true shape and likely increased somewhat in size during submergence.

No.	Length	Width
1	35	19
2	35	20
3	35	20
4	36	20
5	36	22
6	36	22
7	37	23
8	38	25
9	39	24
10	39	25
11	40	26
12	41	30
	—	—
Average 38.1		23.0

***Lampropeltis dolliata annulata* Kennicott.**

On May 28, 1949, a female of this subspecies was collected at Christine, Texas. The snake measured 712 mm. in total length. Between 10:00 a.m. and 4:23 p.m., June 5, the snake laid 5 eggs with smooth, adhesive shells.

No.	Length	Width
1	48	18
2	48	19
3	49	20
4	49	21
5	52	20
	—	—
Average 49.2		19.6

Two days before hatching, the eggs appeared somewhat collapsed, and on July 24, fifty days after oviposition, slits appeared in 2 of the eggs. The following morning 2 hatchlings were found coiled on the floor of the incubation dish, and during the afternoon a third hatched.

No.	Total length	Tail length
1	231	34
2	234	35
3	237	36
	—	—
	Average 234.0	35.0

***Natrix sipedon confluens* Blanchard.**

A large female, 715 mm. long, collected by Lawrence Curtis in central Texas, was confined for 16 months with a smaller, almost totally black male from Louisiana. On the morning of July 25, 1950, ten new-born young were found in the cage. All were light in color and vividly marked.

No.	Total length	Tail length
1	176	26
2	209	54
3	213	51
4	220	54
5	221	58
6	225	54
7	225	60
8	230	55
9	234	57
10	239	60
	—	—
	Average 219.2	52.9

***Thamnophis marclanus marclanus* (Baird & Girard).**

Two females collected at Helotes, Texas, gave birth to young during 1950. The young of the first brood all had mid-dorsal stripes of pale yellow while those of the second brood possessed stripes of pale orange.

I. Eleven young were born on June 19 to a female 676 mm. long.

No.	Total length
1	175
2	179
3	180
4	186
5	187
6	191
7	192
8	198
9	198
10	200
11	202
	—

Average 189.8

II. Six young were born on July 21 to a female which measured 843 mm. in total length.

No.	Total length
1	123
2	156
3	159
4	166
5	173
6	181
	—

Average 159.6

***Thamnophis sirtalis annectens* Brown.**

A female collected in Dallas County by Lawrence Curtis gave birth to 7 young on August 3, 1950. Two of these died and were discarded before measurements were taken.

No.	Total length	Tail length
1	208	57
2	212	52
3	218	51
4	219	51
5	228	61
	—	—
	Average 217.0	54.4

***Hypsiglena ochrorhyncha texana* Stejneger.**

On March 10, 1950, a female which measured 488 mm. in total length and 63 mm. in tail length, was collected 19.3 miles north of San Ygnacio, Zapata County, Texas. She laid a clutch of 4 eggs, with smooth, non-granular shells, on April 25, 1950.

No.	Length	Width
1	27	11
2	29	9
3	29	10
4	32	10
	—	—
	Average 29.2	10.0

Two of these hatched on June 18.

No.	Total length	Tail length
1	146	23
2	153	22
	—	—
	Average 149.5	22.5

The young possess a ground color of light gray, which ends abruptly on the first and second scale rows. Primary dorsal body blotches, which number 47 in one specimen and 49 in the other, have an olive-brown color, and are from 2 to 4 scales long and from 3 to 6 scales wide. Spaces between blotches are 1 or 2 scales long. A series of smaller lateral blotches is located below, and alternates with the dorsal series. Below the lateral blotches is a third row of spots, occupying the second, third, and sometimes fourth row of scales.

Ventrum white and immaculate.

Top of head light gray with scattered spots of olive brown. A broad, brown postocular stripe extends backward from the eye, intercepting the four posterior upper labials, and widening at the neck to form the first nuchal blotch. Chin stippled with brown, most heavily pigmented on the mental, lower labials and chin shields.

Thirteen days after hatching, the young ate newly-hatched *Sceloporus olivaceus*, but refused to eat small *Anolis carolinensis* which were offered from time to time. Most of the day the snakes remained hidden beneath the sand in their cage, coming to the surface to prowl only after dark.

***Trimorphodon biscutatus semirutus* Smith.**

There is no information in the literature concerning the eggs and young of this large Mexican opisthoglyph snake.

I. On November 2, 1948, a male, in an apparent attempt to mate with a much larger female cagemate, vigorously pursued her about the tree limbs in their cage. During this activity the male often interrupted his pursuit and, with neck raised at a slight angle, moved his head from side to side in a slow waving motion through a horizontal arc of nearly ninety degrees. This courting behavior continued for nearly three hours, but no coitus was observed.

At 5:01 p.m. on December 29, 1948, the female deposited the first of 20 eggs while loosely coiled in a tree limb more than 3 feet above the cage floor. During the following day and night, 18 additional eggs were laid, and on January 7 the last egg was deposited.

The eggs were of diverse shapes and sizes, non-granular and covered with an adhesive substance. Eggs which came in contact with one another after being placed in the incubation dish, readily adhered. On December 30, when 18 of the 20 eggs were laid, the shortest and longest time intervals between ovipositions were nine-and-a-half minutes, and one hour and twenty minutes, respectively. Each oviposition required from 14 to 48 seconds and averaged nearly 24 seconds.

From early morning until late in the afternoon on December 28, just prior to egg laying, the female was coiled in the cage pool. At no other time during her confinement was a predilection for water observed.

None of the eggs hatched. Dissection revealed their contents to be tough, spongy masses; doubtless a sign of infertility.

No.	Length	Width
1	30	19
2	31	19
3	31	19
4	31	20
5	32	19
6	33	18
7	34	21
8	35	19
9	35	23
10	36	23
11	37	24
12	38	23
13	40	25
14	41	17
15	43	22
16	43	23
17	43	24
18	43	24
19	43	24
20	45	24
—	—	—
Average 37.1		21.5

II. Twenty eggs were laid on March 3, 1949, by a female said to be from Colima, Mexico. Length of female, 1,793 mm.

No.	Length	Width
1	34	22
2	35	22
3	35	23
4	36	21
5	36	22
6	36	23
7	36	25
8	37	16
9	37	21
10	37	21
11	37	21
12	37	21
13	37	22
14	37	22
15	37	24
16	38	18
17	38	20
18	40	24
19	42	19
20	42	20
—	—	—
Average 37.2		21.3

***Micrurus fulvius tenere* Baird & Girard.**

A large female was received May 15, 1950, from the Santa Rosa Hospital in San Antonio, Texas, after having bitten a man. After the accident, the victim brought the snake to the hospital for identification, not convinced that the bite was poisonous. At the Zoo the snake was placed in a cage with 3 other coral snakes. On May 16, and again on May 18, the smaller male in the cage mated with the new arrival. The latter died on June 3, 1950, presumably from the effects of an insecticide used to spray the moss in the cage. Dissection of the snake disclosed 9 eggs with thin, soft shells, not yet fully developed. Four of the eggs were accidentally broken before they were measured. The remaining eggs measured:

No.	Length	Width
1	14	9
2	15	11
3	15	11
4	16	11
5	17	11
—	—	—
Average 15.4		10.6

***Agkistrodon contortrix laticinctus* Gloyd & Conant.**

A female was collected by Jack Ried at Helotes, Texas, on August 14, 1950. On September 3 she passed 4 fully-developed, still-born young.

No.	Total length	Tail length
1	225	38
2	226	38
3	228	36
4	230	37
—	—	—
Average 227.2		37.2

***Crotalus atrox* Baird & Girard.**

A small female was collected during the night of July 14, 1949, several miles south of Nuevo Laredo, Tamaulipas, Mexico. The snake measured 887 mm. in total length. On August 20, between 3:21 p.m. and 5:36 p.m., she gave birth to 10 young.

No.	Total length ¹
1	214
2	282
3	291
4	291
5	291
6	293
7	295
8	296
9	301
10	316
<hr/>	
Average 287.0	

***Crotalus lepidus lepidus* Rafinesque.**

A female of this subspecies from the Blackstone Ranch, 13 miles south of Sheffield, Terrell County, Texas, gave birth to 3 young on July 21, 1950. The mother measured 512 mm. in total length.

No.	Total length	Tail length
1	210	21
2	214	21
3	229	22
<hr/>		<hr/>
Average 217.6		21.3

The adult shows a departure from the normal coloration of this form in Texas, being exceptionally light with much-faded crossbands. The young, however, are more vividly colored, with dark gray (almost black) crossbands on a ground color of lighter gray.

Food items taken by the new-born snakes include young *Sceloporus olivaceus*, small *Anolis carolinensis*, and new-born mice.

***Crotalus viridis viridis* Rafinesque.**

Two females, apparently gravid upon arrival at the San Antonio Zoo, were collected by Ted Klein at the Crow Ranch in Randall County, Texas.

I. The first of these, a female, 811 mm. long, was found dead in its cage on the morning of August 22, 1950. No reason for the death could be determined. Dissection of the snake revealed 12 well-developed embryos with considerable yolk still attached. The embryo males were easily recognizable, their penes being everted and very dark in color—an indication that parturition was still some time away.

No.	Total length	Tail length
1	193	11
2	195	14
3	200	12
4	204	12

5	204	15
6	206	11
7	208	13
8	209	16
9	210	14
10	211	13
11	212	17
12	214	17

Average 205.5 13.7

II. This female measured 850 mm. in total length. She died on August 27, 1950. A partially atrophied runt embryo was found tightly lodged in the uterus near the cloaca, and this was followed by 11 fully-developed, normal embryos, obviously ready to be born.

No.	Total length	Tail length
1	187	15
2	233	17
3	250	15
4	252	19
5	256	18
6	258	17
7	259	18
8	260	19
9	262	20
10	267	22
11	270	16

Average 250.3 17.8

***Lepidocheilus kempii* (Garman).**

Much of the following information was supplied by Mr. Jesse R. Laurence, of Corpus Christi, Texas, who donated to the Zoo the 4 hatchling turtles mentioned in the notes.

The mother, estimated to weigh about 125 pounds, was seen to crawl onto the beach at Padre Island, at a point about 45 miles south-east of Corpus Christi, Texas, March 23, 1950. The turtle laid approximately 100 eggs in a hole which she had dug in the beach, and later covered these with sand. The eggs were described as, "... about the size of ping pong balls, with firm but pliable shells." Eighteen of these were returned to the home of Mr. Laurence and placed in a bushel basket filled with sand. The eggs were 6 inches below the surface. The basket was kept outdoors where the sun could shine directly on it, and, occasionally, as the sand became dry, it was sprinkled with water. Sixty-two days after oviposition, on July 25, the eggs began to hatch, the young being about, "... the size of a silver dollar." At 120 days of age, 4 surviving young measured:

No.	Carapace length	Carapace width
1	105	91
2	117	93
3	119	94
4	121	95
<hr/>		<hr/>
Average 115.5		93.2

All possess 3 very pronounced longitudinal keels on the carapace, one along the vertebral row of shields and one on each row of costals. The median keel is much the highest.

¹ Measurements of these and the following rattlesnakes do not include the "button" or rattle.

The plastron has 4 longitudinal keels which are only about a third as high as those on the carapace.

The young turtles are uniformly black above, with narrow, white edging on all limbs and along the outer edge of the carapace. Beneath they are white with variable black markings.

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EXPLANATION OF THE PLATES.

All photos by Darling and Werler, San Antonio Zoological Society, unless otherwise credited.

PLATE I.

- Fig. 1. Female *Eumeces lynce furcirostris* and young born to her on March 12, 1950. Total brood numbered five.
- Fig. 2. Female *Eumeces brevilineatus* from near San Antonio, Texas, and clutch of 12 eggs laid May 18, 1949. The 3 buff-colored eggs, recognizable in the photo, desiccated soon after being laid. (Photo by MacAllister)

PLATE II.

- Fig. 3. Two *Eumeces brevilineatus* emerged from the eggs on June 13, twenty-six days after oviposition. The egg shells of the hatchlings are visible between the lizards. (Photo by MacAllister)
- Fig. 4. Female *Abronia taeniata* from near Las Vigas, Veracruz, Mexico, and one of 4 young born to her on April 12, 1950.
- Fig. 5. The young *Abronia taeniata* pictured here have crossbands which are shortened, and interrupted mid-dorsally, resulting in a pattern of small, paired spots. This probably is an atypical pattern. Two specimens of the same brood, not photographed, possess a pattern of transverse bands which extend uninterrupted across the dorsum.

PLATE III.

- Fig. 6. Female *Gerrhonotus liocephalus infernalis* and 3 young hatched from eggs which she laid on February 18, 1950.
- Fig. 7. Newly hatched young and egg shell of *Gerrhonotus liocephalus infernalis*, April 2, 1950.

PLATE IV.

- Figs. 8, 9, 10. Stages in the egg laying of a *Masticophis mentovarius mentovarius*. The female is from near Alvarado, Veracruz, Mexico.

PLATE V.

- Fig. 11. Clutch of 17 eggs laid by *Masticophis mentovarius mentovarius* from Alvarado, March 23 to 25, 1950.
- Fig. 12. New-born *Elaphe laeta laeta* hatched August 9, 1950.

PLATE VI.

- Fig. 13. Newly-hatched *Elaphe obsoleta confinis* from San Antonio, Texas. The larger dorsal blotches and shorter intervening spaces separating them readily distinguish these Texan hatchlings from a young Florida *confinis* collected near Wakulla Springs.
- Fig. 14. Aberrant hatchling *Elaphe obsoleta confinis* from San Antonio, Texas.
- Fig. 15. Female *Lampropeltis doliata annulata* from Christine, Texas, and clutch of 5 eggs laid on June 5, 1949. (Photo by MacAllister)

PLATE VII.

- Fig. 16. Eggs of *Hypsiglena ochrorhyncha texana* laid April 25, 1950.
- Fig. 17. Female *Crotalus lepidus lepidus* from the Blackstone Ranch, Terrell County, Texas, and brood of newly-born young, July 21, 1950. Young snake at extreme left has not yet broken through the amniotic membrane which encloses it. The adult shows a departure from the normal coloration, being unusually light. The young are darker and more vividly marked.